



Printed Pages : 7

EEC - 101 / EEC - 201

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 3302**

Roll No.

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**B. Tech.**

**(SEM. II) EXAMINATION, 2008-09**

**ELECTRONICS ENGINEERING**



*Time : 3 Hours]*

*[Total Marks : 100*

**Note :** Attempt **all** questions.

**SECTION-A**

**1×20=20**

**1** Attempt all the parts of this questions. All parts of the question carry equal marks. This question contains 20 objectives/fill in the blanks type /true false type questions.

- (i) Diffused impurities with five valence eletrons are called.....
- (ii) In an n-type material the electron is called the.....and the hole is.....
- (iii) In the reverse bias region the reverse saturation current of a silicon diode doubles for energy .....rise in temperature.
- (iv) The wavelength and frequency of light of a specific colour are directly related to the.....of the material.



(v) In the dc mode the levels of  $I_c$  and  $I_B$  are related by a quantity called.....

(vi) The quantity Beta provides an important relationship between the base and collector currents, and is usually between.....

(vii) For C E configuration, typical value of  $Z_i$  are in the range of .....

(viii) Given  $\beta = 150$  and  $I_E = 3.2$  mA for a common emitter configuration with  $r_0 = \infty \Omega$ , the value of  $Z_i$  is.....

(ix) The input controlling variables for a BJT transistor is.....

(x) The input impedance of all commercially available FET is.....

Select the correct answer in the following :

(xi) A semiconductor has a.....

(a) Negative temperature coeff. of resistance

(b) Positive temperature coeff. of resistance

(c) Constant temperature coeff. of resistance

(d) None of these.

(xii) To obtain n-type semiconductor, the impurity added to a pure semiconductor is

(a) Trivalent

(b) Tetravalent

(c) Pentavalent

(d) None of these

(xiii) For a germanium, PN junction the maximum value of barrier potential is

(a) 0.3 V

(b) 0.7 V

(c) 1.3 V

(d) 1.7 V

(xiv) The current  $I_{CBO}$  flows in the

(a) Emitter and base leads

(b) Collector and base leads

(c) Emitter and collector leads

(d) None of these

(xv) A biasing circuit has a stability factor of 40. If due to temperature change,  $I_{co}$  change by  $1 \mu A$ , then  $I_c$  will change by

(a)  $20 \mu A$

(b)  $40 \mu A$

(c)  $80 \mu A$

(d) None of these.





(xvi) A zener diode has a sharp break-down voltage at low reverse voltage. The above statement is

- (a) True
- (b) False

(xvii) A varactor diode is optimised for its variable capacitance. Above statement is

- (a) True
- (b) False

(xviii) The most commonly used transistor circuit arrangement is common collector. The above statement is

- (a) True
- (b) False

(xix) The emitter of a transistor is doped moderately. The above statement is

- (a) True
- (b) False

(xx) The ideal value of stability factor is 10. The above statement is

- (a) True
- (b) False

## SECTION-B

**Note :** Attempt any **three** parts of the following: **10×3=30**

- 2 (a) Explain the working of Half wave and Fullwave bridge rectifier. What are the advantages of full wave rectifier ?
- (b) A half wave rectifier is used to supply 10 V d.c. to a resistive load of  $400\ \Omega$ . If the crystal diode has a forward resistance of  $20\ \Omega$ . Determine the value of a.c. voltage supplied to the circuit.
- (c) Explain the potential divider biasing circuit.
- (d) Explain the CE and CC configuration of BJT.
- (e) What is OPAMP ? How it is used as an integrator and summer ?

## SECTION-C

**10×5=50**

**Note :** Attempt **all** the questions. All questions carry **equal** marks.

3 Attempt any **one** part of the following :

- (a) Explain the construction and characteristics of JFET.
- (b) Explain the basic construction, operation and characteristics of MOSFET.



4 Attempt any **one** part of the following :

(a) (i) Convert the  $(725.25)_{10}$  to its equivalent in Base-2, Base-8 and base -16

(ii) Perform  $M-N$  and  $M+N$  if  $M=10101$  and  $N=1111$

(b) Discuss the postulates of boolean algebra. How it is different from ordinary algebra ? What are universal gates ?

Implement the expression of XOR gate with the help of NAND gates only.

5 Attempt any **one** part of the following :

(a) Simplify the boolean function  $F$  in sum of products using don't care conditions  $d$  (using K-map)

(i)  $F = Y' + X'Z'$

$d = YZ + XY$

(ii)  $F = B'C'D' + BCD' + ABCD'$

$d = B'CD' + A'BC'D$

(b) How zener diode is used as shunt regulator ? Explain it.

6 Attempt any **one** part of the following :

(a) Explain the working of digital multimeter. What are its application ?

(b) Discuss in detail CRO. How is used for measurement of frequency ?

7 Attempt any **one** part of the following :

(a) Explain the working of positive clipper and negative clamper circuits.

(b) The input voltage  $V_i$  to the two level clipper shown in figure varies linearly from 0 to 150V. Sketch and determine the output voltage  $V_o$  to the same time scale as the input voltage. Assume ideal diodes.

